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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/568,804	02/06/2007	Hongguang Zhang	T2332-11218US01	7238

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MILES & STOCKBRIDGE PC
1751 PINNACLE DRIVE
SUITE 500
MCLEAN, VA 22102-3833

EXAMINER	
VELASQUEZ, VANESSA T	
ART UNIT	PAPER NUMBER
1793	

NOTIFICATION DATE	DELIVERY MODE
10/14/2009	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/568,804	ZHANG, HONGGUANG	
	Examiner	Art Unit	
	Vanessa Velasquez	1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 February 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-24* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-24* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *2/21/2006*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Status of Claims

Claims 1-24 are pending and presented for examination.

Priority

1. Acknowledgment is made of Applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d). The certified copy of Australian application no. 2003904385 has been received and placed in the file.

Information Disclosure Statement

2. One (1) information disclosure statement (IDS) was submitted on February 21, 2006. The submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Duplicate Claims Warning

3. Applicant is advised that should claims 12 and 13 be found allowable, claims 22 and 23 will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

Claim Objections

4. Claims 8, 9, and 13 are objected to because of typographical errors. In claims 8 and 9, it appears that "FeEDT A" and "EDT A" should be "FeEDTA" and "EDTA," respectively, as is consistent with claim 10. In claim 13, it appears that "thlosemicarbazide" should be "thiosemicarbazide" as is consistent with claim 23. Appropriate correction is required.

Claim Rejections - 35 USC § 112, Second Paragraph

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 1-11, 14-21, and 24 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

With regard to claims 1 and 14, the phrase "chemically related" fails to define the metes and bounds of the claimed substance because it raises questions as to what or how a substance would be considered chemically related. Is the substance a derivative of, a precursor to, or a reaction product of thiourea? Claims 2-11 and 15-21 are likewise rejected for being dependent on rejected base claims.

With regard to claim 24, the claim is rejected as being indefinite in that it fails to point out what is included or excluded by the claim language. The use of language such as "substantially as hereinbefore" and "with reference to Examples 2 to 6" does not

clearly define the scope of the claim. It should further be noted that the claim appears to be a method claim, yet it fails to recite any active, positive method steps. This claim is an omnibus type claim (MPEP § 2173.05(r)). Applicant is notified that the nature of this claim precludes examination; consequently, no art rejections will be applied until the rejection under the second paragraph of 35 U.S.C. 112 is overcome.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 1, 5, 6, 12-14, 20, 22, and 23 are rejected under 35 U.S.C. 102(b) as being anticipated by Kandemir (GB 2 180 829 A).

Regarding claims 1 and 14, Kandemir teaches a method of extracting gold from ores, concentrates, and tailings by subjecting gold-containing substrate to a leach medium (page 1, lines 5-7, 54-59). The leach medium contains a sulphide-oxidizing bacteria (oxidant) along with one or more of the following chemical reagents: thiourea, chlorine, hypochlorite, chloride, thiosulphate, and thiocyanate (page 2, lines 46-55; page 3, lines 14-15; page 11, lines 32-33, 49-51). The gold is recovered (page 3, lines 53-56). It is noted that the oxidizing bacteria oxidize the auriferous sulphide, not the thiosulphate (page 1, lines 54-59).

Regarding claims 5 and 6, the thiosulphate may be in the form of sodium thiosulphate (page 2, lines 53-55).

Regarding claims 12, 13, 22, and 23, the claim recites that thiourea or a compound chemically related to thiourea is present in the leach solution. Kandemir teaches that thiourea may be present in the leach solution (page 2, lines 46-55), thereby satisfying the claim. Kandemir also teaches that formamidine disulphide may be present in the leach solution (page 6, lines 49-56).

Regarding claim 20, the gold may be recovered by cementation (page 2, lines 1-5).

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

10. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

11. Claims 2, 7, 18, and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kandemir (GB 2 180 829 A), as applied to claims 1 and 14 above.

Regarding claims 2 and 19, Kandemir teaches that the thiourea may have a concentration of 0.1-5.0 grams per liter of leach solution (0.001314-0.06569 mole/L) (page 6, lines 49-51), which overlaps the claimed range. The overlap between the ranges in the prior art and recited in the claims creates a *prima facie* case of obviousness because it would have been obvious for one of ordinary skill in the art to have optimized within a range already known in the art (MPEP § 2144.05).

Regarding claims 7 and 18, Kandemir teaches that the chemical reagent (i.e., any one or combination of thiourea, chlorine, hypochlorite, chloride, thiosulphate, and thiocyanate) may be in proportion of 0.5-35% w/v (weight or mass per unit volume) (page 6, lines 32-36). In the instance the chemical reagent is sodium thiosulphate (molecular weight: 158.11) and the unit volume is a liter, the concentration of sodium thiosuphate would be 0.003162-0.2213 mole/liter, which overlaps the claimed range.

12. Claims 3, 4, 9, 10, and 15-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kandemir (GB 2 180 829 A), as applied to claims 1 and 14 above, and further in view of Kenna (US 5,260,040).

Regarding claims 3, 4, 15, and 16, Kandemir does not teach the presence of ethylenediamenetetraacetate (EDTA) in the leach solution. Kenna teaches the addition of ethylene diamene tetra acetic acid (EDTA) and salts of EDTA (a salt of acetic acid is acetate) to a thiourea leach solution for leaching gold from gold-bearing materials

(abstract). Ferric ions oxidize and permanently decompose thiourea, which plays a critical role in the extraction of gold (Kenna, col. 1, lines 40-58; col. 2, lines 9-23). When EDTA and salts thereof are added, they form complexes with ferric ions (EDTA-iron complexes), preventing decomposition of the thiourea (Kenna, col. 2, lines 9-23). It is noted that Kandemir encounters the same problem of the decomposition of thiourea into formamidine disulfide and sulfur by the presence of ferric ion (multivalent metal) that forms from bacterial oxidation (page 3, lines 15-21). Therefore, it would have been obvious to one of ordinary skill in the art to have added EDTA salts of Kenna to the leach solution of Kandemir for the purpose of reducing the occurrences of the decomposition of thiourea into products such as sulfur, which would lessen the effectiveness of thiourea as a leaching fluid.

Further regarding claims 3, 4, 15, and 16 and regarding claim 9, the EDTA salts may be prepared before addition to the leach solution or added directly to the solution (Kenna, col. 3, lines 46-51). Kenna teaches that EDTA salts are suitable for the process therein (Table 1).

Regarding claims 10 and 17, the ferric ion-EDTA complex is at least 0.0025-0.1 M (mole/L) (Kenna, Table 2, "Fe"), which overlaps the claimed range. Since EDTA forms a complex with at least one ferric ion, the ferric ion-EDTA complex concentration must be at least the concentration of ferric ion to which it bonds.

13. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kandemir (GB 2 180 829 A) in view of Kenna (US 5,260,040), as applied to claim 4 above, and further in view of *Hawley's Condensed Chemical Dictionary*.

Regarding claim 8, Kandemir in view of Kenna teach that the EDTA salts may be prepared before addition to the leach solution or added directly to the solution (Kenna, col. 3, lines 46-51). Kenna teaches that EDTA salts are suitable for the process therein (Table 1). Kandemir in view of Kenna do not teach the specific FeEDTA complex to be prepared prior to addition to the leach solution. However, those of ordinary skill in the art would understand that EDTA salts encompass those that include ferrous EDTA salt complexes, as evidenced by *Hawley's Condensed Chemical Dictionary* (definition of "ethylenediamenetetraacetic acid"). *Hawley's Condensed Chemical Dictionary* teach various metal chelating agents that exist in their salt complex forms before addition to a reaction bath (definition of "ethylenediamenetetraacetic acid"; "Use" section).

14. Claims 1-7 and 9-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Thomas et al. (US 5,785,736) in view of Kenna (US 5,260,040).

Regarding claims 1 and 14, Thomas et al. teach a process for extracting gold from ore slurry (abstract). The leaching solution contains a thiosulfate and copper ions (oxidiant) (Thomas et al., col. 9, lines 1-14, 28-32). The copper ions oxidize gold, not the thiosulphate (Thomas et al., col. 9, lines 28-32). Thomas et al. do not teach the presence of thiourea. Kenna, drawn to a method of extracting gold from gold-bearing material, teaches that thiourea is a suitable leaching fluid for recovering gold (col. 1,

lines 29-37). It has been held that "[i]t is prima facie obvious to combine two compositions each of which is taught by the prior art to be useful for the same purpose, in order to form a third composition to be used for the very same purpose.... [T]he idea of combining them flows logically from their having been individually taught in the prior art" (*In re Kerkhoven*, 626 F.2d 846, 850, 205 USPQ 1069, 1072 (CCPA 1980) (citations omitted)). Thus, in the present case, it would have been obvious to one of ordinary skill in the art to have added thiourea, as disclosed by Kenna, to the thiosulfate leaching solution of Thomas et al. because of their recognized status in the art as being equivalents (MPEP § 2144.06).

Regarding claims 2 and 19, the thiourea concentration is 0.005-0.4 M (mole/L) (Kenna, Table 2), which overlaps the claimed range. The overlap between the ranges of the prior art and those recited in the claims creates a *prima facie* case of obviousness because it would have been obvious for one of ordinary skill in the art to have optimized within a range already known in the art (MPEP § 2144.05).

Regarding claims 3, 4, 15, and 16, Kenna teaches the addition of ethylene diamene tetra acetic acid (EDTA) and salts of EDTA (a salt of acetic acid is acetate) to a thiourea leach solution for leaching gold from gold-bearing materials (abstract). Ferric ions oxidize and permanently decompose thiourea, which plays a critical role in the extraction of gold (Kenna, col. 1, lines 40-58; col. 2, lines 9-23). When EDTA and salts thereof are added, they form complexes with ferric ions (EDTA-iron complexes), preventing decomposition of the thiourea (Kenna, col. 2, lines 9-23). It is noted that Thomas et al. would encounter the same problem of the decomposition of thiourea into

formamidine disulfide and sulfur by the presence of ferric ion (multivalent metal) that forms from decomposition of iron sulfides found in many gold-bearing ores (col. 7, lines 29-38). Therefore, it furthermore would have been obvious to one of ordinary skill in the art to have added EDTA salts of Kenna to the leach solution of Kandemir for the purpose of reducing the occurrences of the decomposition of thiourea into products such as sulfur, which would lessen the effectiveness of thiourea as a leaching fluid.

Further regarding claims 3, 4, 15, and 16 and regarding claim 9, the EDTA salts may be prepared before addition to the leach solution or added directly to the solution (Kenna, col. 3, lines 46-51). Kenna teaches that EDTA salts are suitable for the process therein (Table 1).

Regarding claims 10 and 17, the ferric ion-EDTA complex is at least 0.0025-0.1 M (mole/L) (Kenna, Table 2, "Fe"), which overlaps the claimed range. Since EDTA forms a complex with at least one ferric ion, the ferric ion-EDTA complex concentration must be at least the concentration of ferric ion to which it bonds.

Regarding claims 5-7 and 18, the thiosulfate may be sodium thiosulfate with a concentration of 0.01-0.1 M (mole/L) (Thomas et al., col. 8, lines 64-67 to col. 9, lines 1-6), which overlaps the claimed range.

Regarding claims 11 and 21, the pH of the leaching fluids during leaching is 7-8.7 (Thomas et al., col. 10, lines 7-10), which overlaps the claimed range.

Regarding claims 12, 13, 22, and 23, the claim recites that thiourea or a compound chemically related to thiourea is present in the leach solution. Kenna

teaches the presence of thiourea in leaching solution (abstract), which satisfies the claim limitation of thiourea.

Regarding claim 20, the gold may be recovered by cementation procedures (Thomas et al., col. 12, lines 66-67 to col. 13, lines 1-8).

15. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Thomas et al. (US 5,785,736) in view of Kenna (US 5,260,040), as applied to claims 4 above, and further in view of *Hawley's Condensed Chemical Dictionary*.

Regarding claim 8, Thomas et al. in view of Kenna teach that the EDTA salts may be prepared before addition to the leach solution or added directly to the solution (Kenna, col. 3, lines 46-51). Kenna teaches that EDTA salts are suitable for the process therein (Table 1). Thomas et al. in view of Kenna do not teach the specific FeEDTA complex to be prepared prior to addition to the leach solution. However, those of ordinary skill in the art would understand that EDTA salts encompass those that include ferrous EDTA salt complexes, as evidenced by *Hawley's Condensed Chemical Dictionary* (definition of "ethylenediamenetetraacetic acid"). *Hawley's Condensed Chemical Dictionary* teach various metal chelating agents that exist in their salt complex forms before addition to a reaction bath (definition of "ethylenediamenetetraacetic acid"; "Use" section).

Conclusion

No claims are allowable.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Vanessa Velasquez whose telephone number is 571-270-3587. The examiner can normally be reached on Monday-Friday 9:00 AM-6:00 PM ET.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on 571-272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Roy King/
Supervisory Patent Examiner, Art Unit 1793

/Vanessa Velasquez/
Examiner, Art Unit 1793